Lake Steward

The newsletter of King County Lake Stewardship program Vol. 9, No. 2 Spring 2002

Organic weed and bug management

Grow Smart, Grow Safe

By now most homeowners recognize the health benefits of using less chemicals and toxic substances on lawns and gardens. Besides the danger pesticides pose to small children and pets, rainwater can wash bug and weed killers from lawns into nearby lakes and streams. (Recent studies found 23 different insect and weed killers in streams around Puget Sound.) Chemical fertilizers wash from lawns into local waters, causing an increase in algae that chokes out fish and other water dwellers. But going natural doesn't necessarily mean giving up having a beautiful lawn and a bountiful garden.

Easy Lawn Care

Keeping your lawn green may be easier than you think. The mantra of today's natural yarder is "Mow high, mow often, and leave the clippings." So forget about the extra chore of bagging clippings. Leaving cut grass (called "grasscycling") on your lawn provides free fertilizer. This helps lawns to grow greener and denser, and unlike chemical fertilizers, grasscycling doesn't cause thatch buildup.

You can recycle clippings with your existing mower. For best results, keep the blade sharp and mow when grass is dry. If there are visible clumps, mow again to break them up. If you are thinking of replacing your mower, consider the newest generation of rechargeable electric mulching mowers. They are plenty powerful, yet quiet, clean, and a breeze to start.

Be Water-Wise

Grasses do better when the whole root zone is wetted and then partially dries out between waterings. Shallow, frequent watering leads to shallow rooting, making grass prone to disease, weeds, and other problems. Shallow over-watering also leaches nutrients from the soil, promoting lawn disease. Experts recommend watering about one inch per week during July and August. Use less water in late spring or early fall when chances for rain are greater. Signs of a lawn needing more water include a duller color and grass blades that stay bent in your footprint rather than popping up. Another tip: Aerate the lawn if water will not penetrate because of soil compaction or thatch buildup.

Consider adding native plants to your yard for a more care-free, natural landscape.

Natural Pest Control

While a whole host of pests can bug the Northwest gardener, most would agree that none is more bothersome than slugs. If you have trouble with these creatures eating your garden, take an integrated

(continued on page 6)

What's Inside. . .

KING COUNTY

Lake monitors report

Summer Samplers

From late April through mid-October, volunteers on dozens of local lakes collect water samples every other week as part of King County's Lake Stewardship program. Analysis of the water includes nitrogen, phosphorus, chlorophyll *a*, and algae enumeration. By measuring the concentrations of nutrients and the abundance and composition of the algae, we gain a better understanding of current and future water quality trends.

Too many nutrients?

Nutrients occur naturally in water and are necessary for the growth of plants and animals. However, development around lakes, as well as some recreational activities, have increased nutrient inputs to lakes. Plants such as algae use many different nutrients, but two nutrients are primary: **nitrogen** (N) and **phosphorus** (P). Both are measured in the samples collected by volunteers. The nutrient in shortest supply in a lake is called the "limiting" nutrient because when it is exhausted, algae must slow down growth. Most algae in western Washington lakes are limited by the amount of phosphorus available. Hence, when more phosphorus is added, more growth can occur. Sometimes when phosphorus increases, nitrogen becomes the limiting nutrient. This can seesaw back and forth through the season.

Some major sources of nitrogen and phosphorus input include:

- Storm water runoff carrying organic material, fertilizers, and feces from pets, waterfowl
- Failing septic systems
- Decomposing organic material in the lake

Tiny Plants, Big Problems

Algae are tiny plants that can grow attached to things or float freely through the water. Since volunteer monitors collect water over the lake's deepest point, the algae most often found are the free-floating varieties, called **phytoplankton**. At the King County Environmental Lab, samples are analyzed for **chlorophyll *a***, (the green pigment that plants use to make food) which generally indicates the levels of algae present. Identifying and counting the different species provides information on seasonal changes. Once a record of "normal" algae patterns is established for a lake, it may be possible to recognize abnormalities or even to predict changes in the future.

Sometimes algae make rapid growth, leading to a "bloom." Algal blooms occur naturally, although effects of human activities in watersheds can dramatically increase their frequency. Some lakes periodically experience "nuisance blooms" marked by poor water clarity, unpleasant smells, or rising levels of bacteria. In rare cases, the release of toxins becomes a health hazard. The algae most likely to create these problems are the bluegreens. Large amounts of these simple organisms may create surface scums colored from blue-green to brown, purple, and even orange.

Continuing Analysis

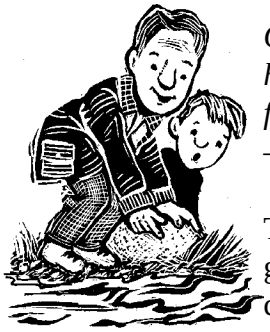
Analysis of samples collected by volunteer monitors has provided an excellent snapshot of current water quality conditions and improved understanding of water quality trends in some King County lakes. To learn more about the water quality in your lake, visit the Lake Stewardship website at **http://dnr.metrokc.gov/wlr/waterres/smlakes/index.htm** and click on the *Water Quality Trend Report.*

A Weighty Issue: How to Anchor?

For volunteers who collect water samples on their lakes, care must be taken to anchor in the proper spot and to keep the boat steady when pulling up the water sampler. We are looking for suggestions from volunteers on the best ways to anchor. If you have a tried and true method, please pass it along to our staff at (206) 296-8008 or (206) 296-0516.

What formed our lakes?

Ask Dr. Lakenstein



Can you tell me how my lake was formed?
—History Buff

There are many geological processes that form lakes. Major landslides, the collapse of volcanic craters, earthquakes moving blocks of land, changes in riverbeds with flooding—all these events can create new lakes or modify older ones. But the main reason we have lakes today can be tied to an icy process that happened thousands of years ago thanks to giant, lumbering glaciers.

Most King County lakes originated as a result of the last continental glaciation in our region, which reached its maximum extent about 15,000 years ago. Ice almost a mile high covered the Puget Lowland as far south as Chehalis. The slow movement of glaciers scoured the land, creating irregularities in the surface. In addition, the massive amounts of rock, gravel, and clay held by the ice settled in irregular heaps, leaving hummocks and depression that filled with water.

Water levels in the new lakes either climbed until a low spot on the rim was reached and water spilled out (the threshold or "outlet") or reached a balance between the water entering the lake, evaporation, and groundwater in the surrounding terrain.

The same processes are important today, although human intervention has changed some of the relationships by adjusting the height of the threshold with dams and weirs, changing groundwater levels with well withdrawal or artificial irrigation of the terrain, and other civilized activities.

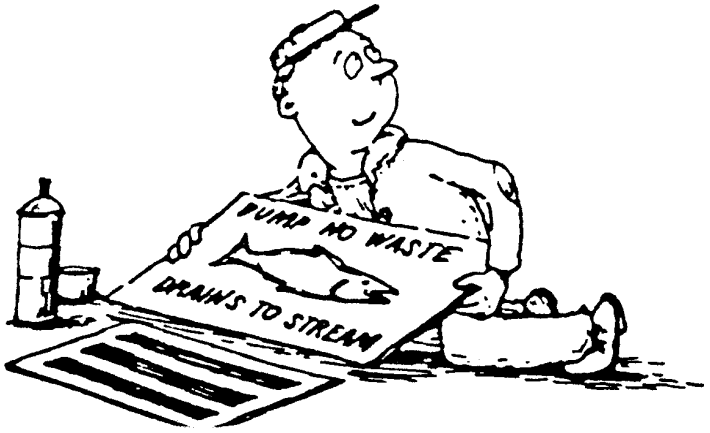
Two free programs to help you keep your lake clean!

Don't Strain the Drain

Did you know that water runoff flowing into many storm drains dumps into the closest lake or river without treatment? Soaps and other cleansers typically flow directly to drains when vehicles are washed in the street. More problematic are instances when oil and other toxic chemicals are poured directly into storm drains. To minimize direct runoff into your lake, two free programs are available to residents of unincorporated King County.

Storm Drain Stencils

Stenciling drains helps communities realize how their actions with household chemicals and oil waste affect the environment. Stenciling area storm drains is a fun, hands-on volunteer opportunity, perfect for individuals or groups.



Also, should you or your neighbors have plans to organize a charity car wash this summer, be sure to borrow a Clean Water Car Wash Kit from King County.

Keep Dirty Water Out

Dirty and soapy wash water is kept out of the storm drain system through a simple arrangement that captures and pumps water to the sanitary sewer for treatment. Your organization will not only raise money, but awareness for the need to protect local waterways for the benefit of all.

For more information or to borrow a free car washing kit or storm drain stencil kit, contact **Lexi Taylor** at **(206) 296-8287** or **lexi.taylor@metrokc.gov**

King County at work

Take a Tax Break

King County offers tax breaks to property owners who preserve their land in its natural state. The Public Benefit Rating System (PBRS) and the Timber Land programs are two popular county-wide programs that provide incentives to encourage private landowners to voluntarily conserve and protect land resources, open space, and timber. In return for preserving resources, the land is assessed at a value consistent with its "current use" rather than the "highest and best use."

The reduction in assessed land value ranges from 50 percent to as much as 90 percent for the portion of the land participating in the program. Over 650 landowners with 7,500 acres are presently participating in these two programs.

Your property may be eligible for a tax credit under the Public Benefit Rating System (PBRS).

Program Requirements Overview

To be eligible for these tax incentive programs, certain criteria must be met. For the Timber Land program, the property needs to contain between five (5) and twenty (20) acres of forestland. Also, the owner must have an approved and implemented forest stewardship or timber management plan.

The Public Benefit Rating System is based on a point system. Points are assigned to specific resources. Examples of resources include properties that have stream buffers, groundwater protection areas, threatened or endangered wildlife, public recreation and access, forestland, farmland, and/or historic value. The total points awarded on a property translates into a percentage of tax reduction for the portion of the land enrolled in the PBRS.

The annual application deadline is December 31 (one year in advance of the expected assessed value reduction). For more information on these programs, contact **Ted Sullivan**, PBRS and Timberland Program Coordinator at **(206) 205-5170** or e-mail him at **ted.sullivan@metrokc.gov**. You can also look up additional information online at **http://dnr.metrokc.gov/wlr/lands/incentiv.htm**

Welcome Katie!

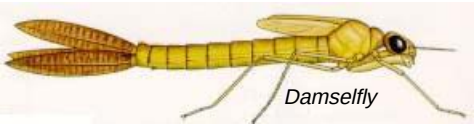
Meet Katie Sauter, the newest member of the Lake Stewardship program staff. With a Masters in forestry, Katie has an extensive background in local environmental issues. She will coordinate the work of the volunteer lake monitors and track incoming data. Katie will also lead upcoming educational workshops and lend her technical expertise to a variety of Lake Stewardship projects.

Katie most recently worked for the Seattle Urban Nature Project inventorying parks and open space resources. Prior to that she has worked on a variety of ecological and humanitarian projects in Russia. (She has a Bachelor's degree in Russian.) Her extensive communication skills in two languages also include published articles and photos in national magazines. Katie is excited to be working with so many dedicated volunteers and lakefront property owners.

New staff member Katie Sauter.

The Buzz on the Strange and Spineless

Small lakes harbor many strange and wonderful invertebrate organisms (animals without backbones). The diversity of aquatic invertebrates in small lakes can be phenomenal, including protozoans, sponges, hydrozoans, rotifers, bryozoans, worms, flatworms, flukes, nematodes, leeches, insects, spiders, crustaceans and mollusks. Like fish, freshwater invertebrates are found in different areas of lakes—the water surface, the water column, the bottom and shoreline—and have specific adaptations and lifestyles for life in these habitats.



Damselfly

Surface Skimmers

Some invertebrates live on the surface of a lake. Water striders skim along the surface, while other organisms such as hydras and snails hang down from the surface. Some of the more ubiquitous denizens of the surface are mosquito and midge larvae. These larvae look like hairy wriggling worms as they rest near the top using specialized tubes to breath air. They eat algae, microscopic animals, and organic debris before metamorphosing into pupae then emerging as very different looking winged adults.

Bottom Dwellers

Invertebrates that dwell on lake bottoms have a rich diet of sunken algae and detritus. These bottom dwellers, known as benthic organisms, have adaptations that enable them to live in low oxygen levels. Bright red bloodworms standout because of the hemoglobin in their blood which increases their oxygen capacity. Crayfish are found on the bottom, too. Large for invertebrates, they are members of the Crustacea, organisms that have ten legs rather than six (like insects) or eight (like spiders).

Crayfish are bottom dwellers.

Water Column Life

The most predominant organisms that swim and drift in open water are tiny crustaceans, copepods, and rotifers which are collectively called zooplankton. Most of these are filter feeders; they sieve fine food particles such as phytoplankton from the water. One of the most common is *Daphnia*, also called a water flea. Copepods are similar in size and look like miniature torpedoes. Both organisms are able to withstand and adapt to the varied food supplies and environmental conditions (temperature, light, water chemistry) in lakes.

Close-up of a water flea.

Shoreline Denizens

Along the shoreline are organisms specially adapted to living on and off of large aquatic plants. True bugs (in the order Hemiptera), such as backswimmers and water boatmen, can be seen swimming on the surface, crawling along vegetation, or flying at night. These insects have specialized mouthparts for piercing or sucking their plant or animal prey. Some true bugs, such as the giant water bug (three inches long), can ambush much larger prey such as frogs and fish. These water bugs have been known to try out human prey—hence the common name of "toe-biters."

Other insects of near shore habitats include dragonflies and damselflies nymphs. Their mouthparts are long and hinged with two sharp pincers at the end. Dragonfly nymphs prey on fish and frogs as easily as the giant water bugs. Adult dragonflies prey mostly on other insects such as mosquitoes. Dragonflies, with their superb vision and large wings, are the aerial acrobats of the insect world, and have been clocked at speeds over 25 miles per hour.

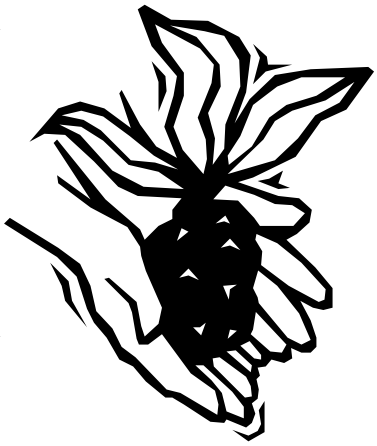
See for Yourself

You can easily observe the riot of invertebrate life in your lake: scoop up some water with a strainer or meat baster, put it in a white pan and use a magnifying glass to look at the smaller organisms. Sampling different places in your lake will net you different types of organisms. To insure a steady diet for fish and other vertebrate life, be sure to put your sample back in the water.

Grow. . .

(continued from page 1)

approach. Start with prevention methods and use chemicals as a last resort. (FYI: Dogs are attracted to slug bait containing the chemical metaldehyde, which can be deadly if eaten.)



Reduce slug habitat by keeping the garden clean of debris such as pots, boards, and other materials. At night, using a flashlight, remove and destroy any slugs you see by dropping them into a jar of soapy water. (This kills them immediately.) Next, use barriers around most susceptible plants. Copper barriers are most effective, but many people report success with pea gravel, ground oyster shell, and egg shells. Others use old plastic containers partially filled with beer as homemade, organic traps. Containers should be covered to keep out rain.

Other Natural Hints

Chemical herbicides are considered pesticides. They should be used as a last resort for weed control and only to spot-treat individual weeds rather than sprayed over an entire lawn or landscape. Mulches used around landscape beds and gardens conserve moisture and reduce weeds. To control powdery mildew on garden plants such as roses, try mixing one teaspoon of baking soda and a few drops of dishwashing liquid into a quart of water. Spray weekly during the spring to reduce the occurrence of mildew later in the summer.

To receive even more natural lawn and garden tips and a consumer's guide to on where to buy the least-hazardous products, request the booklet, *Grow smart, grow safe* by calling King County's Hazardous Waste Management Program at **(206) 689-3064** or e-mail Annette Frahm at **annette.frahm @metrokc.gov**.

KING COUNTY

Water and Land Resources Division
201 South Jackson Street, Suite 600
Seattle, WA 98104

PRESORTED
STANDARD
US POSTAGE PAID
SEATTLE, WA
Permit No. 6013

Lake Steward Spring 2002

Duplicate mailings? Change of address?
Call WLR at (206) 296-1959 or send your label, with the correct address clearly marked, to the above address, Attn: Suzanne Rowe, Editor. Please allow 6-8 weeks for changes.

Printed on recycled paper. Please recycle.

Large Print

Alternative formats of newsletter available upon request. Call (206) 296-1959 for information.